

Student: _____	Instructor: Randie Johnson	Assignment: Math Analysis Summer
Date: _____	Course: Math Analysis 2016	Practice

1. Write the set by listing the elements.

$\{x \mid x \text{ is a natural number less than } 9\}$

The set of all natural numbers less than 9 is {_____}.

(Use a comma to separate answers as needed. Use ascending order.)

2. Write the set by listing the elements.

$\{a \mid a \text{ is an integer less than or equal to } 4\}$

Choose the appropriate set from the possibilities listed below.

- A. $\{\dots, 1, 2, 3\}$
 B. $\{4, 5, 6, \dots\}$
 C. $\{5, 6, 7, \dots\}$
 D. $\{\dots, 2, 3, 4\}$

3. Find $\{x \mid x \text{ is a number that is both rational and irrational}\}$.

Choose the correct set below.

- A. $\{\sqrt{x}, \sqrt{-x}\}$
 B. \emptyset
 C. $\{0, 1, 2, 3, 4, 5, \dots\}$
 D. $\{0\}$

4. Write the set using set-builder notation.

$\{2, 4, 6, 8\}$

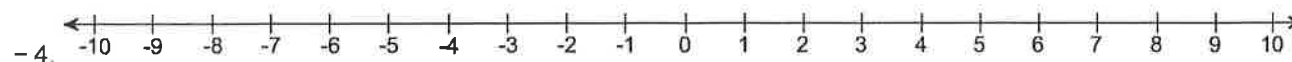
Choose the correct set.

- A. $\{x \mid x \text{ is an even natural number}\}$
 B. $\{x \mid x \text{ is a natural number less than or equal to } 8\}$
 C. $\{x \mid x \text{ is an even natural number less than or equal to } 8\}$

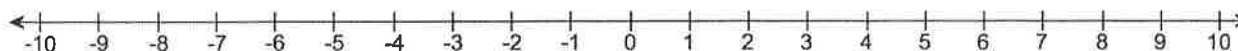
5. Graph the following numbers on a number line.

$\{-4, -3, 1\}$

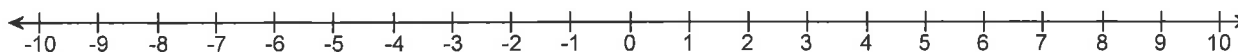
Graph



Graph -3.



Graph 1.



6. Consider the set $\left\{-2, 5, \frac{1}{2}, \frac{5}{8}, 0, \sqrt{2}, \sqrt{7}, 2.13, \frac{71}{72}\right\}$.

List the elements that are **a) natural numbers**, **b) whole numbers**, **c) integers**, **d) rational numbers**, **e) irrational numbers** and **f) real numbers**.

a) Select the correct choice below and fill in any answer boxes present in your choice.

- A.** The set of natural numbers in the given set is $\{\underline{\hspace{2cm}}\}$.
(Use a comma to separate answers as needed.)
- B.** The set of natural numbers in the given set is the empty set.

b) Select the correct choice below and fill in any answer boxes present in your choice.

- A.** The set of whole numbers in the given set is $\{\underline{\hspace{2cm}}\}$.
(Use a comma to separate answers as needed.)
- B.** The set of whole numbers in the given set is the empty set.

c) Select the correct choice below and fill in any answer boxes present in your choice.

- A.** The set of integers in the given set is $\{\underline{\hspace{2cm}}\}$.
(Use a comma to separate answers as needed.)
- B.** The set of integers in the given set is the empty set.

d) Select the correct choice below and fill in any answer boxes present in your choice.

- A.** The set of rational numbers in the given set is $\{\underline{\hspace{2cm}}\}$.
(Use a comma to separate answers as needed.)
- B.** The set of rational numbers in the given set is the empty set.

e) Select the correct choice below and fill in any answer boxes present in your choice.

- A.** The set of irrational numbers in the given set is $\{\underline{\hspace{2cm}}\}$.
(Use a comma to separate answers as needed.)
- B.** The set of irrational numbers in the given set is the empty set.

f) Select the correct choice below and fill in any answer boxes present in your choice.

- A.** The set of real numbers in the given set is $\{\underline{\hspace{2cm}}\}$.
(Use a comma to separate answers as needed.)
- B.** The set of real numbers in the given set is the empty set.

7. Find (a) the additive inverse and (b) the absolute value of the given number.

$$-\frac{5}{9}$$

(a) The additive inverse of $-\frac{5}{9}$ is $\underline{\hspace{2cm}}$.

(b) The absolute value of $-\frac{5}{9}$ is $\underline{\hspace{2cm}}$.

8. Find the value of the following expression.

$$-|3|$$

The value is $\underline{\hspace{2cm}}$.

9. Find the value of the expression.

$$|-11| + |4| =$$

$$|-11| + |4|$$

10. The table shows the percent change in a Consumer Price Index from the previous year for 1996 and 1997.

Which category shows the smallest percentage increase from 1996 to 1997?

- A. Apparel and upkeep
 B. Food
 C. Public transportation
 D. Fuel and utilities

Category	Percent Change from 1995 to 1996	Percent Change from 1996 to 1997
Apparel & upkeep	.9	4.4
Food	3.2	4.1
Fuel & utilities	-2.3	-1.1
Private trans.	-4.7	-3.0
Public trans.	5.9	3.5

11. Although coral reefs are generally found in shallow water, coral also survives at much greater depths. The coral sightings in the table are charted as negative numbers in feet. Identify the deepest and the shallowest sites.

Location	Coral Depths
Site A	-12,069
Site B	-19,500
Site C	-16,164
Site D	-9,123
Site E	-5,829
Site F	-12,364

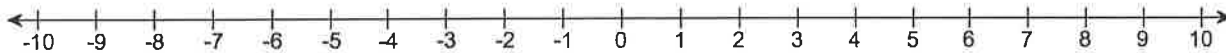
What site is the deepest?

- Site E
 Site B
 Site D
 Site F

What site is the shallowest?

- Site A
 Site D
 Site E
 Site B

12. Use the number line to answer true or false to the following statement. $-5 > -4$



Is the statement $-5 > -4$ true or false?

- False
 True

13. Rewrite the statement so that it uses $<$ instead.

$$-12 > -19$$

The inequality $-12 > -19$ can be rewritten as _____.
(Type an inequality.)

14. Use an inequality symbol to write the statement.

10 is greater than or equal to x .

In symbols, this statement is _____.

15. Translate the following statement.

$$3n + 5 \text{ is not equal to } 5.$$

Choose the correct statement below.

- A. $3n + 5 \neq 5$
 B. $3n + 5 \neq 5$
 C. $3n + 5 \neq 5$
 D. $3n + 5 = 5$

16. Simplify the following statement and decide whether it is true or false.

$$5 \cdot 4 \geq 4 + 3$$

Is the inequality true or false?

- False
 True


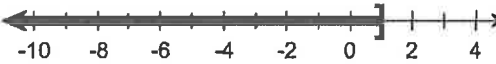

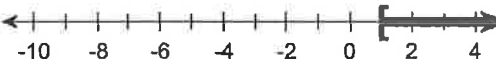
17. Write this set in interval notation and graph the interval.

$$\{x \mid x \leq 1\}$$

The interval is _____.

(Type your answer in interval notation.)

Choose the correct graph.

- A. 
 B. 
- C. 
 D. 


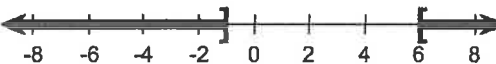
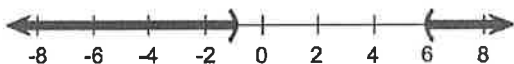

18. Write the set in interval notation and graph the interval.

$$\{x \mid -1 \leq x \leq 6\}$$

The interval is _____.

(Type your answer in interval notation.)

Which graph is correct?

- A. 
 B. 
- C. 
 D. 

19. Add.

$$-\frac{2}{11} + \frac{3}{5}$$

$$-\frac{2}{11} + \frac{3}{5} = \underline{\hspace{2cm}}$$

20. Find the difference.

$$\frac{9}{10} - \left(-\frac{7}{3}\right)$$

$$\frac{9}{10} - \left(-\frac{7}{3}\right) = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an integer or a fraction.)

21. Perform the indicated operations.

$$3 - (-4) + 8$$

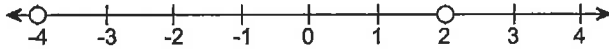
$$3 - (-4) + 8 = \underline{\hspace{2cm}}$$

22. Add or subtract as indicated.

$$\left(-\frac{7}{4} - \frac{2}{3}\right) + \frac{1}{6}$$

$$\left(-\frac{7}{4} - \frac{2}{3}\right) + \frac{1}{6} = \underline{\hspace{2cm}} \text{ (Simplify your answer.)}$$

23. Find the distance on the number line between -4 and 2 .



What is the distance? $\underline{\hspace{2cm}}$

24. Multiply.

$$\frac{3}{4}(-36)$$

$$\frac{3}{4}(-36) = \underline{\hspace{2cm}}$$

(Simplify your answer.)

25. Multiply.

$$\left(-\frac{9}{7}\right)\left(-\frac{3}{5}\right)$$

$$\left(-\frac{9}{7}\right)\left(-\frac{3}{5}\right) = \underline{\hspace{2cm}}$$

(Type an integer or a simplified fraction.)

26. Multiply.

$$-3.1(-3.05)$$

$$-3.1(-3.05) = \underline{\hspace{2cm}}$$

27. Divide.

$$\frac{42}{-21}$$

Select the correct choice below and fill in any answer boxes in your choice.

- A. The answer is $\underline{\hspace{2cm}}$.
- B. The answer is undefined.

28. Divide where possible.

$$-\frac{10}{13} \div \left(-\frac{14}{5}\right)$$

Select the correct choice below and fill in any answer boxes in your choice.

- A. The answer is $\underline{\hspace{2cm}}$.
- (Type an integer or a fraction.)
- B. The answer is undefined.

29. Divide and simplify.

$$\frac{\frac{7}{4}}{\frac{14}{3}}$$

Select the correct choice below and fill in any answer boxes in your choice.

- A. The answer is _____.
- B. The answer is undefined.

30. The highest temperature ever recorded in a certain town was 93° Fahrenheit. The lowest temperature ever recorded there was -20° Fahrenheit. What is the difference between these two temperatures?

The difference is _____ $^{\circ}$ Fahrenheit.

31. Write in exponential notation.

$$\frac{14}{15} \cdot \frac{14}{15} \cdot \frac{14}{15} \cdot \frac{14}{15}$$

Choose the same number expressed in exponential notation.

- A. $4\left(\frac{14}{15}\right)$
- B. $\frac{14^4}{15}$
- C. $\left(\frac{14}{15}\right)^4$
- D. $\frac{38416}{50625}$

32. Evaluate the expression.

$$\left(\frac{1}{5}\right)^2$$

$$\left(\frac{1}{5}\right)^2 = \underline{\hspace{2cm}}$$

33. Simplify, using the laws of exponents.

$$(-5)^2$$

$(-5)^2 = \underline{\hspace{2cm}}$
(Simplify your answer. Type an integer.)

34. Find the square root.

$$-\sqrt{361}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. $-\sqrt{361} = \underline{\hspace{2cm}}$ (Simplify your answer.)
- B. The square root is not a real number.

35. Find the square root.

$$\sqrt{\frac{16}{49}}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

A. $\sqrt{\frac{16}{49}} =$ _____

B. The square root is not a real number.

36. Simplify the expression. Use the order of operations.

$$23 - 8 \cdot 10 - (-2)^3$$

$$23 - 8 \cdot 10 - (-2)^3 =$$

 (Simplify your answer.)

37. Simplify.

$$-3 |4 - 7| + 5^2$$

$$-3 |4 - 7| + 5^2 =$$

 (Simplify your answer.)

38. Simplify the expression. Use the order of operations.

$$10 + \frac{5}{8}(-16) - \frac{3}{10} \cdot 50$$

$$10 + \frac{5}{8}(-16) - \frac{3}{10} \cdot 50 =$$

 (Simplify your answer.)

39. Simplify the following expression.

$$\frac{(-8 + \sqrt{4})(-4^2)}{-4 - 2}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

A. $\frac{(-8 + \sqrt{4})(-4^2)}{-4 - 2} =$ _____ (Simplify your answer.)

B. The answer is not a real number.

40. Evaluate if $t = -7$, $b = 64$, and $g = 8$.

$$\sqrt{b} + g - t$$

$$\sqrt{b} + g - t =$$

 (Simplify your answer.)

41. Evaluate the expression if $a = -5$, $b = 42$, and $c = 2$.

$$\frac{3c + a^3}{9b + 3a}$$

$$\frac{3c + a^3}{9b + 3a} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an integer or a fraction.)

42. Evaluate the expression if $r = -\frac{5}{2}$ and $t = \frac{1}{2}$.

$$rt + t^4$$

$$rt + t^4 = \underline{\hspace{2cm}}$$

(Type an integer or a simplified fraction.)

43. An approximation of the amount in billions of dollars that consumers have spent on cookies from 1993 to 2001 can be obtained by substituting a given year x in the following expression. Approximate the amount spent in the years 1993, 1997, and 2001.

$$1.624x - 3223$$

In 1993, consumers spent \$ billion dollars on cookies.
(Type an integer or a decimal rounded to the nearest tenth as needed.)

In 1997, consumers spent \$ billion dollars on cookies.
(Type an integer or a decimal rounded to the nearest tenth as needed.)

In 2001, consumers spent \$ billion dollars on cookies.
(Type an integer or a decimal rounded to the nearest tenth as needed.)

44. Use the properties of real numbers to simplify the following expression.

$$10s - 17s$$

$$10s - 17s = \underline{\hspace{2cm}}$$

45. Use the distributive property to rewrite the expression without parentheses.

$$-(-3f - 7y)$$

Which of the following rewrites $-(-3f - 7y)$ without parentheses?

- A. $(-3f - 7y)(-1)$
 B. $10fy$
 C. $3f - 7y$
 D. $3f + 7y$

46. Use the distributive property to rewrite the expression. Then simplify.

$$36 \cdot 93 + 36 \cdot 7$$

Rewrite using the distributive property.

$$36 \cdot 93 + 36 \cdot 7 = \underline{\hspace{2cm}}$$

(Do not simplify.)

Simplify the answer.

47. Use the distributive property to calculate the value of the following expression in your head.

$$66 \cdot \frac{8}{5} - 6 \cdot \frac{8}{5}$$

$$66 \cdot \frac{8}{5} - 6 \cdot \frac{8}{5} = \underline{\hspace{2cm}}$$

48. Simplify the following expression.

$$-84p + 8p - 5p + 4 + 50$$

$$-84p + 8p - 5p + 4 + 50 = \underline{\hspace{2cm}}$$

49. Simplify the following by removing parentheses and combining like terms.

$$0.25(16 + 4p) - 0.5(8 + 2p)$$

$$0.25(16 + 4p) - 0.5(8 + 2p) = \underline{\hspace{2cm}}$$

50. Simplify the following by removing parentheses and combining terms.

$$-(2y + 7) + 3(2y + 4) - 2y$$

$$-(2y + 7) + 3(2y + 4) - 2y = \underline{\hspace{2cm}}$$

51. Determine whether the given equation is linear.

$$9x - 9 = 3(x + 3)$$

Is this equation linear?

- No
 Yes

52. Solve.

$$6 - 4x = 6x - 8x + 8$$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution set is $\{\underline{\hspace{2cm}}\}$.
(Type an integer or a simplified fraction.)
- B. The solution set is all real numbers.
- C. The solution set is \emptyset .

53. Solve the equation.

$$-7(v + 3) + 3v + 5 = 7v + 12$$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution set is { _____ }.
(Type an integer or a simplified fraction.)
- B. The solution set is all real numbers.
- C. The solution set is \emptyset .

54. Solve for x and check.

$$4x + 5(x - 8) = 4(x - 5)$$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution set is { _____ }.
(Type an integer or a simplified fraction.)
- B. The solution set is all real numbers.
- C. The solution set is \emptyset .

55. Solve the equation.

$$2[p - (2p + 6) + 3] = 2(p + 3)$$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution set is { _____ }.
(Type an integer or a simplified fraction.)
- B. The solution set is all real numbers.
- C. The solution set is \emptyset .

56. Solve.

$$\frac{3x}{4} + \frac{7x}{2} = 17$$

The solution set is { _____ }.
(Simplify your answer. Type an integer or a fraction.)

57. Solve.

$$b = hnu, \text{ for } u$$

The solution is $u =$ _____.

58. Solve for d.

$$F = \frac{1}{5} k(d - n)$$

The solution is $d =$ _____.

59. A black racer snake travels 34.5 km in 15 hours. What is the speed in km/h ?

The speed is _____ km/h .
(Round to the nearest tenth.)

60. Find the length of each side of the square.

The perimeter is 112 feet.

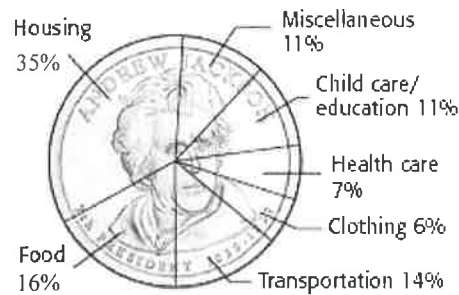


Each side has length equal to _____ feet.
(Simplify your answer. Type an integer or a fraction.)

61. A real estate agent earned \$6900 commission on a property sale of \$230,000. What is her rate of commission?

The rate of commission is _____ %.

62. An average middle-income family will spend \$242,220 to raise a child born in 2004 from birth to age 17. The graph shows the percents spent for various categories. To the nearest dollar, how much will be spent to provide housing for the child? Use the graph to answer.



To provide housing for the child, the family will spend approximately \$ _____.
(Round to the nearest whole number as needed.)

63. Decide whether the following is an equation or an expression.

$$4(x + 3) - 5(6x - 4) = 15$$

Choose the correct answer below.

- Expression
 Equation

64. Decide whether the following is an equation or an expression.

$$9(x + 4) - 5(7x - 4) - 15$$

Choose the correct answer below.

- Equation
 Expression

65. Graph and write interval notation.

$$-6 \leq x \leq -1$$

Choose the correct graph of the solution set.

- A.
- B.
- C.
- D.

What is the solution? _____
(Type your answer in interval notation.)

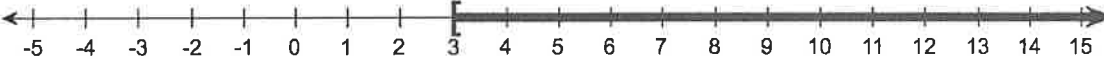

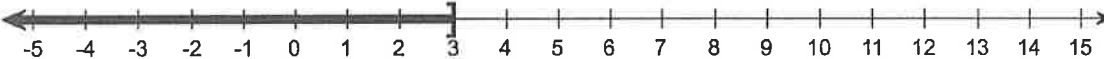
66. Solve the inequality, giving its solution set in both interval and graph forms.

$$4x + 2 \geq 14$$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution set is _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- B. The solution set is \emptyset .

Choose the correct graph form of the solution.

- A. 
- B. 
- C. 



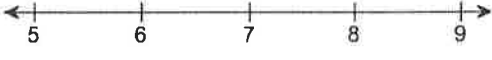


67. Solve the inequality. Write the solution set in interval notation, and graph it.

$$2x + 5 < 19$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- B. The solution set is \emptyset .

Choose the correct graph of the solution.

- A. 
- B. 
- C. 
- D. 
- E. 

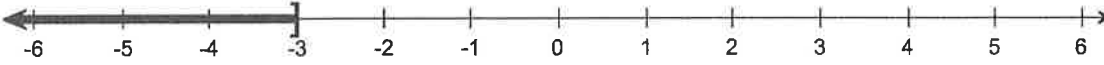
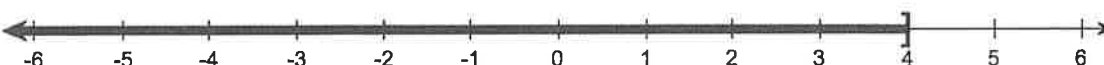


68. Solve the inequality, giving its solution set in both interval and graph form.

$$11x - 12 \geq -4x$$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution set is _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- B. The solution set is \emptyset .

Choose the correct graph.

- A. 
- B. 
- C. 
- D. 

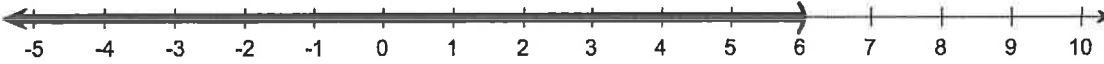
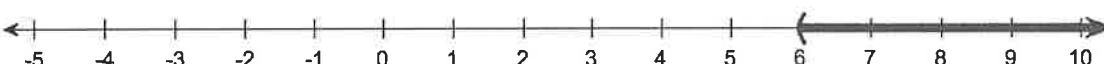

69. Solve the inequality, giving its solution set in both interval and graph forms.

$$-8(z - 9) > 5z - 6$$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution set is _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- B. The solution set is \emptyset .

Choose the correct graph.

- A. 
- B. 
- C. 

70. Find the intersection.

$$\{0, 2, 4, 5, 6, 8\} \cap \{6\}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The intersection is {_____}.
(Use commas to separate answers.)
- B. The intersection is the null set.

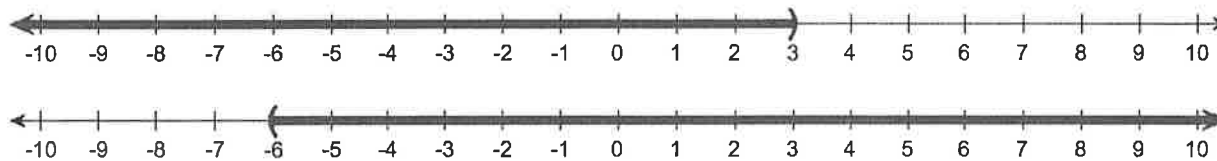
71. Find the union.

$$\{3,4,5,6,7\} \cup \{0,3,5,10\}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The union is $\{ \quad \}$.
(Use commas to separate answers.)
- B. The solution is the empty set.

72. Two sets are specified by graphs. Graph their intersection.



Choose the correct intersection.

- A.
- B.
- C.

73. Give the solution set in both graph and interval form.

$$t < 8 \text{ and } t < 4$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\underline{\hspace{2cm}}$.
(Type your answer in interval notation.)
- B. The solution set is \emptyset .

Choose the graph of the solution set below.

- A.
- B.
- C.
- D.
- E.
- F.

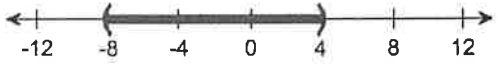
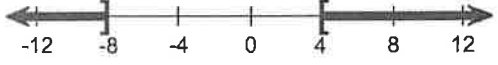
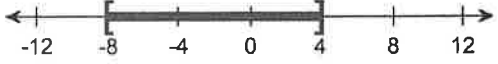
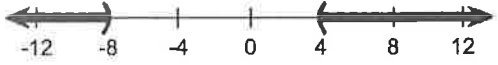

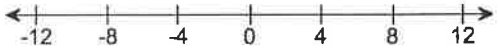
74. Give the solution set in both interval and graph form.

$$x + 2 \geq -6 \text{ and } x + 4 \leq 8$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is _____.
(Type your answer in interval notation.)
- B. The solution set is \emptyset .

Choose the graph of the solution set below.

- A. 
- B. 
- C. 
- D. 
- E. 
- F. 

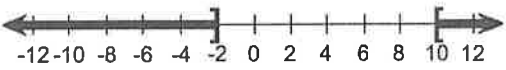
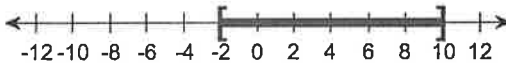
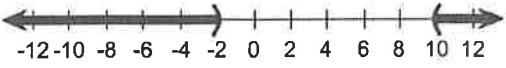
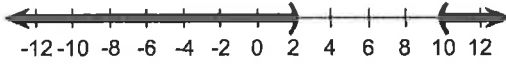

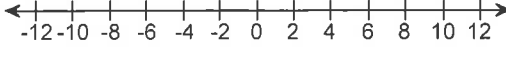
75. For the compound inequality, give the solution set in both interval and graph form.

$$x + 2 > 12 \text{ or } 9 - x > 11$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- B. The solution set is \emptyset .

Choose the correct graph of the solution set.

- A. 
- B. 
- C. 
- D. 
- E. 
- F. 

76. For the given inequality, decide whether intersection or union should be used. Then give the solution set in both interval and graph forms.

$$-4x \leq -20 \text{ or } -4x \geq 0$$

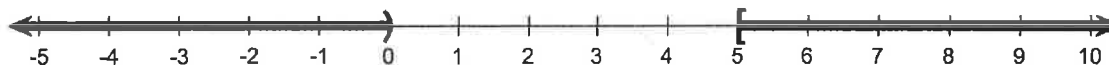
Should an intersection or a union be used?

- Intersection
 Union

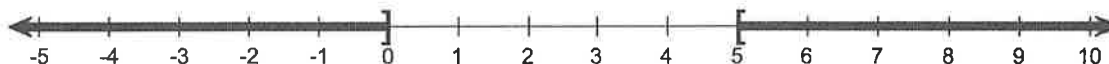
The solution set in interval form is $(-\infty, \underline{\hspace{2cm}}] \cup [\underline{\hspace{2cm}}, \infty)$.

Choose the correct graph form.

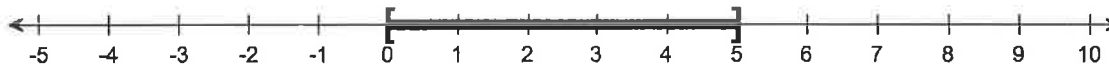
A.



B.



C.



77. Solve.

$$|5y + 5| = 40$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is $\{\underline{\hspace{2cm}}\}$.
 (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
 B. The solution set is \emptyset .

78. Solve the following inequality and graph the solution set.

$$|8y - 9| > 16$$

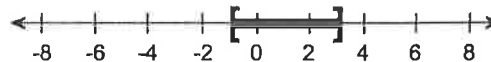
What is the solution set?

$$(-\infty, \underline{\hspace{2cm}}) \cup (\underline{\hspace{2cm}}, \infty)$$

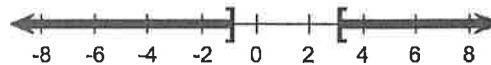
(Simplify your answers. Type an integer or a fraction.)

Choose the correct graph.

A.



B.



C.



D.



79. Solve the inequality. Give the solution set in interval notation.

$$|7x - 2| + 3 \geq 9$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is _____.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- B. The solution set is \emptyset .

80. Solve.

$$|9x + 4| = |x - 11|$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is {_____}.
(Type an integer or a simplified fraction. Use a comma to separate answers.)
- B. The solution set is \emptyset .

81. Solve the absolute value equation.

$$|9x - 54| = 0$$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution set is {_____}.
(Type an integer or a simplified fraction.)
- B. The solution set is \emptyset .

82. Solve the inequality.

$$|4x + 24| \leq 0$$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution set is {_____}.
(Type an integer or a simplified fraction.)
- B. The solution set is \emptyset .